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Economical
Planning of Buildings

Architecture
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ECONOMICAL PLANNING OF BUILDINGS

BY

CLAIR FRED DRURY

AND

MILTON JAMES WHITSON

THESIS FOR DEGREE OF BACHELOR OF SCIENCE
IN ARCHITECTURE

COLLEGE OF ENGINEERING
UNIVERSITY OF ILLINOIS

PRESENTED JUNE 1902

UNIVERSITY OF ILLINOIS

June 1, 1902 190

THIS IS TO CERTIFY THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

Clair Fred Drury and Milton James Whitson

ENTITLED Economical Planning of Buildings

IS APPROVED BY ME AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE DEGREE

OF Bachelor of Science in Architecture

C. C. Picken

HEAD OF DEPARTMENT OF Architecture

UNIVERSITY OF ILLINOIS

1902

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JUNE 1, 1902

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This Thesis is a comparative study of planning.

The proportions found in the plans of the principal classes of buildings have been tabulated and are presented in the following pages.

Besides showing the relations existing between similar parts of buildings erected to serve widely different ends, the data will be of value in assisting the designer to determine whether a problem has been economically solved.

The writers have attempted to familiarize themselves with some good plans of completed

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buildings by working the areas into comparative tables.

Plans were selected which were thought to be representative of their respective classes and the following quantities were computed in each case; total area, area of walls, stairs, corridors, classrooms, toilets, etc. These have been summed under the general heads, useful, general, wall, total, and communication area which constitutes the concise statement of the data of all the computations.

Useful area has been taken to include in all classes of buildings those

rooms which fulfill the primary object of erection; as in the office building the store rooms and the offices, in the school building the classrooms, laboratories and assembly halls.

General area has been taken to include space used for more general purposes as corridors, stair halls, vestibules, toilets and closets.

In selecting plans the object has not been to choose those with the largest percent. of useful area, but those with the right "parti", that is those which were intuitively solved and designed for general good use as well as pure economy.

All of the plans selected represent completed structures.

Explanation of Tables.

In tabulating the data an attempt has been made to keep the tables as simple as possible and to have them self explanatory. As the more specific data concerning some buildings is of much importance it has been deemed advisable to collect this and place it also in connection with the general heads which constitute the greater part of the tables. Therefore our forms vary as well as do the amounts of data. However they all contain the four general quantities

useful, general, wall and total areas. In most cases the areas are in percents of the total area of the building, but in two exceptions they are in percents of the lot area which is shown on the tables.

In the computations of percents the entire sectional area above each floor represents one hundred, and the separate areas represent parts of this hundred. Then in all tables except No. 9 there is a summation of the areas of all the floors, which is represented by one hundred and this summation of the parts is considered as com-

-prising a single floor. For office buildings the percents do not differ greatly, since all floors above the first two stories are alike.

For some classes of structures useful data aside from that already mentioned has been calculated and put into separate tables. For churches the no. of sq. ft. of audience room per sitting and the no. of sq. ft. of total area per sitting. For hospitals the no. of sq. ft. of public ward, private ward, isolation ward, and total area per bed has been calculated.

In office buildings the

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elevator has been given consideration and the no. of sq. ft. each elevator served was computed and tabulated in table No. 24.

MARQUETTE BUILDING

16 stories and 10 ft. attic

Height from grade to cornice

207'-3"

24190 sqft.

" building at 1st story

23790 "

" " " 2nd to 7th inclusive

18900 "

" " " 8th " attic

18331 "

" " " average $\frac{320980}{17}$

18881 "

Percent of average area of building to lot area

7805

Areas " court at 1st story

400 sqft.

" " " 2nd to 7th inclusive

5210 "

" " " 8th " attic

5859 "

" " " average $\frac{90250}{18}$

5321 "

Percent of average court area to lot area

2195

Average rentable area 1st to 16th incl

13524 sqft.

Percent of aver. rentable area to lot area

5596

Cubic contents of building

4397,495 cuft.

TABLE 1
AREAS IN SQ.FT.
OF
MARQUETTE BUILDING.

	JANITOR + METER CL.	OUTSIDE WALLS	CHIMNEY + PIPSHAFT	MACHINERY	STAIRS	HALLS	TOILET ROOMS	ELEVATOR	LIGHT SHAFT	JANITOR + APPARATUS	RENTING	TOTAL OF BLD.
BASE'T		325		9282							19278	28885
1ST	15	853	378		484	3780	50	527			17703	23790
2ND	15	1181	378		460	2144		527			14275	18980
3rd	50	1378	378		327	2620		527			13700	18980
4TH	50	1518	378		230	2530		527			13747	18980
5TH	178	1518	378		230	2530		527			13747	18980
6TH	50	1468	378		230	2530		527			13747	18980
7TH	50	1468	378		230	2602	884	527			12663	18980
8TH	50	1468	378		230	2530		527			13143	18331
9TH	50	1468	378		230	2530		527				18331
10TH	50	1468	378		230	2530		527				18331
11TH	50	1468	378		230	2530		527				18331
12TH	50	1468	378		230	2530		527				18331
13TH	50	1468	378		230	2530		527				18331
14TH	50	1468	378		230	2530		527				18331
15TH	50	1348	378		230	2530		527			13268	18331
16TH	50	1440	378		230	2188	2020	527			11498	18331
ATTIC	550	1468	378	1517	230	1211		527	1064	1051	10353	18331
TOTALS	1390	24341	6426	10799	4491	42375	2454	8959	1064	1051	246015	349865
% OF TL	40	7.00	1.82	3.07	1.28	12.10	.83	2.60	.30	0.030	70.30	100.

OLD COLONY BUILDING.

17 stories and attic or 18' roof space.
 height from grade to cornice
 Area of lot

212'-6"

10115 sqft.

" building at 1st & end stories

10115 "

" " 3rd to attic incl.

10295 "

" " average

10274 "

Percentage of average area of building
 to area of lot

1.0157

Average renting area 1st to 17th story
 inclusive of $\frac{127073}{17} =$

7475

Percentage of average renting area to lot

.739

Cubic contents of building

2202,000 cu ft.

TABLE 2
AREAS IN SQ. FT.
OF
OLD COLONY BUILDING.

	JANITOR METER	OUTSIDE WALLS	CHIMNEY APESHAFT	MACH- INERY	STAIRS	HALLS	TOILET ROOMS	ELEVATOR	LIGHT SHAFT	JANITOR APPARAT.	RENTING	TOTAL B'LD.
BASE'T		102		8146	226						6280	14754
1ST	390	630	106		314	2508		350			5817	10115
2ND	20	848	106		118	1491		350			7180	10115
3RD	110	910	106		118	988		350			7713	10295
4TH	86	980	106		118	950		350			7705	10295
5TH	86	980	106		118	1066		350			7589	10295
6TH	110	980	106		118	1006		350			7625	10295
7TH	110	980	106		118	1006		350			7625	10295
8TH	110	980	106		118	1006	760	350			7625	10295
9TH	110	980	106		118	1006		350			7625	10295
10TH	82	980	106		118	352		350			8305	10295
11TH	82	980	106		118	352		350			8309	10295
12TH	110	980	106		118	854		350			7777	10295
13TH	110	980	106		118	926		350			7705	10295
14TH	110	980	106		118	1006		350			7625	10295
15TH	110	1220	106		118	1010		350			7381	10295
16TH	110	1220	106		118	960		350			7431	10295
17TH	70	661	106		142	1218	952	350			6796	10295
TOTAL	1918	16371	1802	8146	2452	17705	1712	5950			133353	189409
% OF T.	1.00	8.62	.44	4.3	1.4	9.32	.90	3.12			70.4	100.

ATWOOD BUILDING.

10 Stories and attic in portion
Height of building from grade to cornice 130'-0"
Area of lot.

5048 sq. ft.

4967 "

4628 "

4790 "

4775 "

Average per floor

.9459

Percentage of average area of building to
area of lot

Area of court

339 sq. ft.

($\frac{3050}{10}$)

305 "

Percentage of average court area to area of lot.

.0604

Average renting area 1st to 10th inclusive =

$\frac{33335}{10} = 3333.5$

3333

% of average renting area to lot

.66

Cubic feet in building

1,37,3612

TABLE 3
AREAS IN SQ. FT.
OF THE
ATWOOD BUILDING.

	JANITOR + METER	OUTSIDE WALLS	CHIMNEY + PIPESHAFT	MACHI- NERY	STAIRS	HALLS	TOILET ROOMS	ELEVATOR	LIGHT SHAFT	APPARAF- -FUS	RENTING	TOTAL OF 1920.
Bas't		185		2740	145	215		156			3800	7085
1st		245	100		180	506		156			3780	4967
2ND	50	366	67		90	452		156			3447	4628
3RD	50	366	67		90	452		156			3447	4628
4TH	75	409	67		105	666		156			3312	4790
5TH	75	409	67		60	666		156			3357	4790
6TH	75	409	67		60	666		156			3357	4790
7TH	75	409	67		60	666	326	156			3029	4790
8TH	75	409	67		60	666		156			3357	4790
9TH	75	409	67		60	666	516	156			3357	4790
10TH	60	409	67		60	630		156			2892	4790
Attic	25	100	67	180	42	192		156			1168	1930
Totals	635	4125	770	2920	1012	6443	844	1716			38303	58768
% OF T	.0112	.0726	.0136	.0514	.0178	.1135	.0149	.0302			67.48	10000

TACOMA BUILDING.

12 stories and an 8'-6" attic.

Height from grade to cornice
Area of lot.

163'-1 1/2"

8158 sqft.

" building - 1st story

8113 "

" " 2nd to 12th stories incl.

6793 "

" " attic

6547 "

" " Average

6876 "

Percent of average area of building to
area of lot

.8426

Area of court 2nd to attic inclusive.

1566 sqft.

Percent court area to area of lot

.1921

average renting area per floor

4646 sqft.

Percent of avd. renting area to lot area

.57

Cubic contents of building

1,243,625 cuft.

TABLE 4

AREAS IN SQ. FT.
OF THE

TACOMA BUILDING.

	METER CLOSET	JANITOR APP'T	OUTSIDE DIV. WALL	CHIMNEY + APESHAFT	MACHI- NERY	STAIRS	HALLS	TOILET ROOMS	ELEVATOR	LIGHT SHAFT	RENTING	TOTAL OF BLD.
Basmt			675		2346	120	654	236	33		7263	11327
1st	8		978	145		338	762		120	50	5712	8113
2nd	36		884	145		156	973		120		4479	6793
3rd	36		824	145		156	973		120		4339	6793
4th	36		824	145		156	973		120		4539	6793
5th	36		767	145		156	973		120		4596	6793
6th	36		763	145		156	973		120		4600	6793
7th	36		706	145		156	973		120		4657	6793
8th	36		706	145		156	973		120		4657	6793
9th	36		646	145		156	973		120		4717	6793
10th	36		646	145		156	973		120		4717	6793
11th	22		589	145		156	981	220	120		4560	6793
12th	16		589	145		156	891	920	120		3980	6793
Attic		456	600	145		156	498		120	350	4210	6547
Totals	370	456	10197	1085	2346	2318	12543	1376	1593	400	67226	100710
% of T	.37	.45	10.13	1.87	2.33	2.3	12.45	1.37	1.58	.4	66.75	100.00

CHAMPLAIN BUILDING.

15 stories and attic in portion
height from grade to cornice
Area of lot

188'-8"

7085 sqft.

7085 "

6660 "

6422 "

6541 "

9232

building - 1st story

" " 2nd 3rd + 4th stories

" " 5th to 15th stories inclusive

" " Average $\frac{97707}{15}$

Percent of average area of building to
area of lot.

Area of court 2nd 3rd + 4th stories

" " 5th to 15th. " inclusive

" " " Average

Percentage of court to lot area.

Average resulting area 1st to 15 incl. $\frac{67755}{15} =$

Percent of resulting to lot area

Cubic contents of building

425 sqft.

663 " "

573 " "

.0808

4517 sqft.

1637

1,373,612 cuft.

TABLE 5
AREAS IN SQ. FT.
OF THE
CHAMPLAIN BUILDING.

	JANITOR METER CL.	OUTSIDE WALLS	CHIMNEY + APESHAFT	MACHI- NERY	STAIRS	HALLS	TOILET ROOMS.	ELEVATOR	LIGHT SHAFT	RENTING	TOTAL OF B'L'D.
BASE'T	15	240		3972	186	480		42		5260	10195
1ST		378	70		103	894		221		5417	7085
2ND	48	438	70		128	500		221		5235	6660
3RD	48	617	70		128	500		221		5076	6660
4TH	48	617	70		173	500		221		5031	6660
5TH	95	635	70		76	922		221		4403	6422
6TH	95	635	70		76	598		221		4727	6422
7TH	95	635	70		76	598		221		4727	6422
8TH	95	635	70		76	1118	320	221		3887	6422
9TH	95	635	70		76	1118		221		4207	6422
10TH	95	635	70		76	1118		221		4207	6422
11TH	95	635	70		76	1118		221		4207	6422
12TH	95	635	70		76	1118		221		4207	6422
13TH	95	635	70		76	1118		221		4207	6422
14TH	95	635	70		76	1043	576	221		3706	6422
15TH	22	811	70		96	511		221	180	4511	6422
ATTIC		155	20	681	25	90		221	16	411	1619
TOTALS	1131	9626	1070	4653	1601	13344	896	3578	196	73426	109521
% OF T	103	8.8	98	4.25	1.45	122	.81	3.26	.18	67.47	100.00

VENETIAN BUILDING

13 Stories

Height from grade to cornice

158'-0"

Area of lot

5718 sqft.

" " building

5718 " "

Percentage of area of building to lot area.
No Court.

1.00

Average renting area 1st to 13th inclusive

$\frac{52587}{13} = 4045$

4045 sqft.

Percent of average renting to lot area

.707

Cubic contents of building

1023670 cuft.

TABLE 6
AREAS IN SQ. FT.
OF THE
VENETIAN BUILDING

	JANITOR + METEOROL.	OUTSIDE WALLS	CHIMNEY PIPESHORT	MACHIN- ERY	STAIRS	HALLS	TOILETS	ELEVATOR	RENTING	TOTAL OF B.L.D.
Basmt		305		2820	125	170		48	4865	8333
1ST		440	125		70	950		164	3969	5718
2ND	20	475	125		102	522		164	4310	5718
3RD	20	420	125		67	673		164	4249	5718
4TH	20	420	125		67	867	414	164	3641	5718
5TH	20	420	125		67	867	350	164	3705	5718
6TH	20	420	125		67	914		164	4008	5718
7TH	20	420	125		67	814		164	4282	5718
8TH	20	420	125		67	867		164	4055	5718
9TH	20	420	125		67	727		164	4195	5718
10TH	20	500	125		67	932		164	3910	5718
11TH	20	500	125		67	910		164	3932	5718
12TH		500	125		67	712		164	4150	5718
13TH	20	420	125		50	758		164	4181	5718
TOTALS	220	6080	1625	2820	1017	10509	764	2180	57452	82667
% Total	.26	7.35	2.00	3.41	1.23	12.71	.92	2.62	69.50	100.00

WASCHUSETT BUILDING

17 stories		205'-7"
Height from grade to cornice		
Area of lot		6584 sq ft.
" " building 1st and 2nd 16th 17th		6584 " "
" " " 4th to 15th inclusive		6752 " "
" " " average		6703 " "
No court		
Percent of area of building to lot area		1.0333
Average renting area 1st to 17th stories.		4489 sq ft.
Percent of average area to lot area.		.681
Cubic contents of building		1547344 cu ft.

TABLE 7.

AREAS IN SQ. FT.

OF THE WASCHUSETT BUILDING

	JANITOR METEOROL.	OUTSIDE WALLS	CHIMNEY PIPE-SHAFT VERY	STAIRS	HALLS	ELEVATOR TURNS	TOILET ROOMS	RENT- ING	TOTAL OF BIDG.
BASMT		140		186				525.7	9243
1ST	45	539	112	221	1775	217		3675	6584
2ND	48	1120	112	236	565	217		4286	6584
3RD	79	870	112	716	848	217		4342	6584
4TH	79	680	112	85	784	217		4745	6752
5TH	79	680	112	85	1092	217		4487	6752
6TH	79	670	112	85	580	217		5004	6752
7TH	79	670	112	85	1028	217		4561	6752
8TH	79	660	112	85	585	217		5034	6752
9TH	79	610	112	85	1102	217		4547	6752
10TH	79	600	112	85	1106	217		4553	6752
11TH	79	600	112	85	1004	217		4655	6752
12TH	79	590	112	85	1106	217		4563	6752
13TH	79	590	112	85	1004	217		5074	6752
14TH	79	580	112	85	1110	217		4569	6752
15TH	79	580	112	85	750	217		4929	6752
16TH	79	833	112	85	1114	217		4144	6584
17TH	79	823	112	70	1165	217	1020	3098	6584
TOTALS	1258	11835	1904	1934	16309	3689	1020	81578	123187
% TOTALS	102	960	155	157	1324	300	83	66.22	100.00

KATADIN BUILDING

17 stories		205'-7"
Height from grade to cornice		
Area of lot		6584 sqft.
"	Building 1st, 2nd 3rd & 16th 17th	6584 " "
"	" 4th to 15th inclusive	6728 " "
"	" Average	6685 " "
No court.		
Percent of area of building to lot area		1.0153
Average area building 1st to 17th inclusive		4067 sqft.
Percent renting area to lot area.		.6177
Cubic contents of building		1531929 cuft.

TABLE 8
AREAS IN SQ. FT.
OF THE
KATADIN BUILDING.

	UNIFORM METERS	OUTSIDE WALLS	CHIMNEY PIES	MACHIN- ERY	STAIRS	HALLS	TOILET ROOMS	ELEVA- TORS	RENT ING	TOTAL BLD.
Basmt		300		4875	80				3070	8325
1ST	61	597	112		185	1860		217	3532	6384
2ND	59	994	112		207	1482		217	3513	6384
3RD	76	863	112		116	446		217	4734	6384
4TH	76	692	112		85	915		217	4634	6728
5TH	76	676	112		85	1473		217	4089	6728
6TH	76	640	112		85	1463		217	4135	6728
7TH	76	628	112		85	1483		217	4127	6728
8TH	76	588	112		85	1488	230	217	3912	6728
9TH	76	576	112		85	1488		217	4174	6728
10TH	76	530	112		85	1492		217	4196	6728
11TH	76	538	112		85	1492		217	4248	6728
12TH	76	523	112		85	1496		217	4219	6728
13TH	76	519	112		85	1496		217	4223	6728
14TH	76	509	112		85	1500		217	4229	6728
15TH	76	509	112		85	1500		217	4219	6728
16TH	76	688	112		85	1506		217	3900	6384
17TH	76	668	112		85	1398		217	3083	6384
Totals	950	11078	1904	4875	1763	23998	230	3689	72214	121981
% Totals	78	908	136	400	145	1987	21	302	5920	10000

TABLE 9
AREAS IN SQ. FT.
OF OFFICE BUILDINGS.

NAMES	STORY	COURT AREA	COMMUN- ICATION	USEFUL AREA	GENERAL AREA	WALL AREA	TOTAL OF BUILDING	% USEFUL	% GENERAL	% WALL	TOTAL %	% COURT	% COMM.
THE TEMPLE ELEVATORS	1		4923	11248	4923	1845	18016	62.5	26	11.5	100	00	26
	2	574	3153	12031	3727	2258	18016	66.9	20.7	12.4	100	3.2	174
	T.F.	3636	2807	7966	6720	2420	17156	46.5	39.4	14.1	100	21.2	168
ROOKERY ELEVATORS	1		3127	22771	6361	625	29757	76.3	21.4	2.3	100		15
	2	3234	2806	22771	5840	1146	29757	76.5	19.6	3.9	100	18	8.7
	T.F.	4416	3823	18533	4416	2965	29757	62.6	27.6	9.8	100	14.8	12.8
DELIANCE	1		1047	7379	1607	644	9630	76.5	16	6.7	100		18.3
	T.F.	152	1295	6584	2155	1280	10019	65.8	22.4	12.8	100	15	12.9
	1		2593	11800	3049	1651	16500	71.8	17.0	11.2	100		11.1
GREAT NORTHERN	2.		1584	13055	1794	1651	16500	78.9	9.9	11.2	100		9.6
	3		1584	13055	1794	1651	16500	78.9	9.9	11.2	100		9.6
	T.F.	6060	7433	7433	7764	1303	16500	44.3	47.8	7.9	100	36.5	11.3
MASONIC TEMPLE	1		5963	11824	6190	1213	19227	61.9	3.2	6.1	100		31
	T.F.		3410	12021	5012	2194	19227	63.8	28.0	11.6	100		17.8
	1		1043	13565	1043	1742	16350	84.5	24.6	9.2	100		6.3
MARSHALL FIELD STORE + OFFICE BLD.	T.F.	2600	701	13907	701	1742	16350	86.5	4.3	9.2	100		4.3

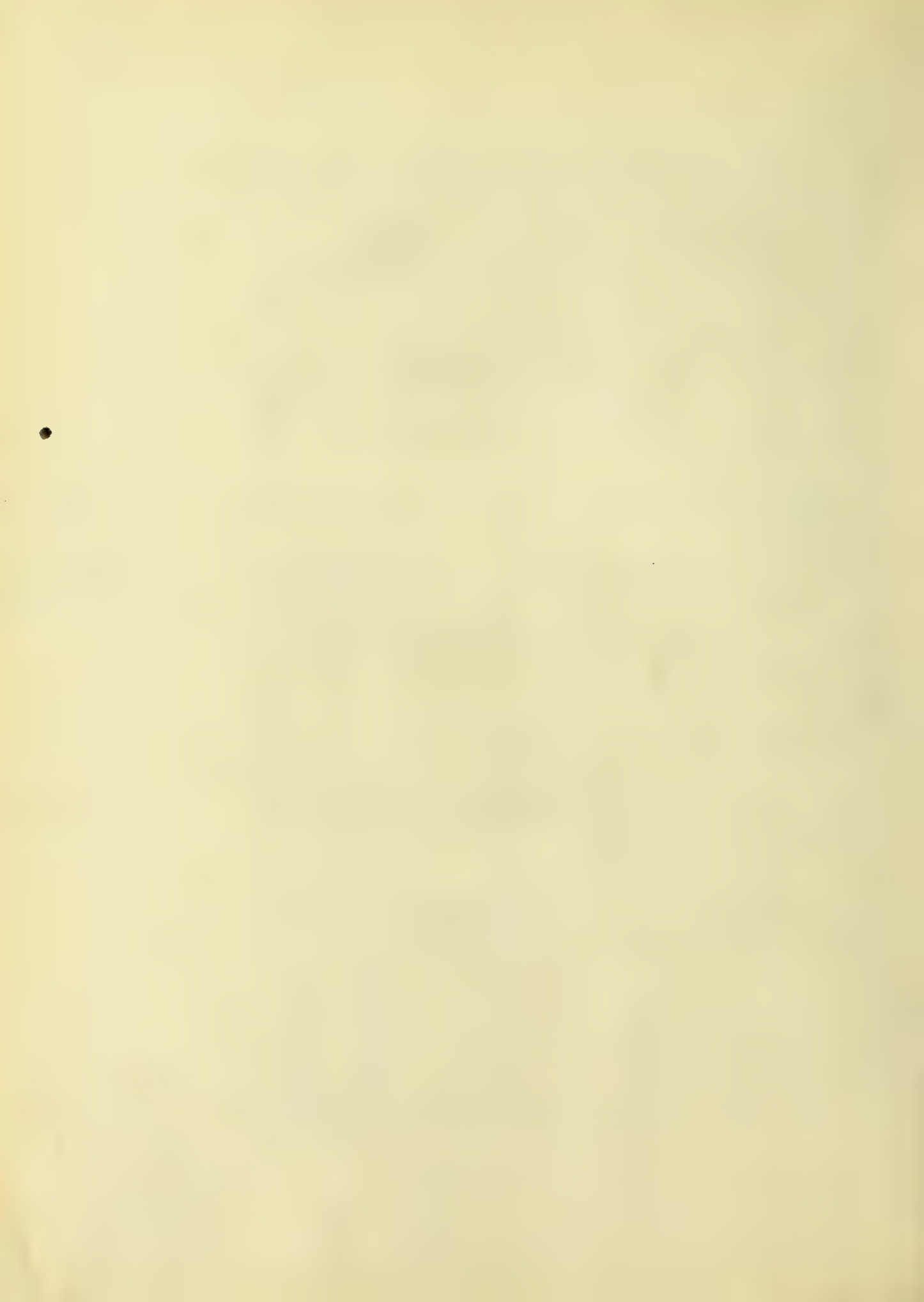


TABLE 10

AREAS IN SQ. FT.

OF

SCHOOL BUILDINGS

	CLASS ROOM	COMMUN-ICATION	USEFUL AREA	GENERAL AREA	WALL AREA	TOTAL OF BUILDING	% USEFUL	% GENERAL	% WALL	TOTAL %	% CLASS	% COMM.
CHICAGO SCHOOL 20 ROOMS	B	2645	13671	4435	1638	20320	67	24.9	8.1	100		13
	1	7092	7925	5285	984	14190	56	37.1	6.9	100	50	26.3
	2	7983	7983	4938	945	13866	57.6	35.5	6.8	100	57.6	24.7
	3	3460	1576	8130 ⁺	2552	11132	73	22.5	4.5	100	31	14.1
TOTAL	18535	11398	31709	17210	4017	59508						
TOTAL PERCENTS	31.	19.1	63.3	28.9	7.8	100						
BARNUM SCHOOL 16 ROOMS	B	3888	5584	7025	2897	15394	36	45	19	100	25	23
	1	7876	3696	8056	2346	14382	56	27.7	16.3	100	54.7	25.7
	2	3888	1892	10276 ⁺	2220	14382	71.4	16.1	12.5	100	27	13
TOTAL	15652	9172	23804	13225	7129	44158						
TOTAL PERCENTS	35.3	20.7	54	29.9	16.1	100						
AGASSIZ SCHOOL	B	984	3525	3976	1595	9033	39	44	17	100		11
	1	4664	2266	2472	1595	9010	55	27.3	17.7	100	51.7	25
	2	4664	2254	5452	1184	9096	60	26	14	100	51	24.7
TOTAL	9328	5504	13915	8808	4374	27139						
TOTAL PERCENTS	34.4	20.2	51.1	32.4	16.5	100						
CHAMPAIGN H.S.	1	2988	1240	3289	1800	5988	55	30	15	100	50	20.7
	2	3476	908	4036	759	5988	67.3	20	12.7	100	58	15.3
		6464	2148	7324	1659	11976						
TOTAL	54	19	61.5	24.2	13.9	100						
TOTAL PERCENTS												

TABLE II
AREAS IN SQ. FT.
OF
SCHOOL BUILDINGS.

NAMES	CLASS ROOMS	COMMUN- ICATION	USEFUL AREA	GENERAL AREA	WALL AREA	TOTAL OF BUILDING	% USEFUL	% GENERAL	% WALL	TOTAL %	% CLASS	% COMM.
ARLINGTON 9 ROOMS	B	3130	4480	4346	2100	10926	41	40	19	100		287
	1	4488	3130	3953	1981	10926	45.7	36.2	18.1	100	41	287
	2	3670	2897	3543	1704	10926	51.9	32.4	15.7	100	32.6	265
TOTAL												
TOTAL PERCENTS												
HIGHLAND PARK	B	2140	4188	4497	2070	10684	38.5	42.1	19.4	100		201
	1	2425	2114	2768	1109	10684	63.5	25.9	10.8	100	22.5	197
	2	3527	1940	2264	926	10396	69.1	23	8.9	100	34	186
TOTAL												
TOTAL PERCENTS												
GARFIELD H.S.	1	4410	1418	4410	1275	7866	56.2	27.6	16.2	100	56.2	17.9
	2	3716	1658	4336	1223	7866	55.1	29.8	15.6	100	47.3	21
		8126	3076	8746	2498	15752						
TOTAL												
TOTAL PERCENTS												
VILLAGE SCHOOL 3 ROOMS	B	452	4074	838	792	5704	71.4	14.5	14.1	100		7.8
	1	3390	1341	3776	792	5704	64	21.9	14.1	100	59	23
	2	3390	1793	7850	1584	11408						
TOTAL												
TOTAL PERCENTS												

NOTE:- + AULA OR ASSEMBLY ON THIS FLOOR

TABLE 12

AREAS IN SQ. FT.

OF

GERMAN SCHOOL BUILDINGS.

NAMES	CLASS ROOMS	COMMON-IGATION	USEFUL AREA	GENERAL AREA	WALL AREA	TOTAL OF BUILDING	% USEFUL	% GENERAL WALL	TOTAL %	% CLASS	% COMM.
GEMEINDESCHULE IN THE WILMS STRASSE BERLIN 21 ROOMS	1	3867	5234	5768	3090	14092	40.8	37.2	100	274	37.2
	2	3271	5148	5628	3316	14092	39.9	36.6	100	37.2	36.6
	3	3867	4696	6421	3071	14092	45.5	32.8	100	274	32.8
TOTAL	13006	15077	17817	15077	9477	42276					
TOTAL PERCENTS	30.8	35.5	42.2	35.5	22.3	100					
GEMEINDESCHULE No. 204 BERLIN 34 ROOMS	1	6720	4171	7870	5226	14741	53.3	35.5	100	455	28.3
	2	7952	4171	9246	4171	14741	62.7	28.3	100	54	28.3
	3	9007	4171	9246	4171	14741	62.7	28.3	100	615	28.3
	4	7775	3412	10113	3412	14741	68.8	22.9	100	53	22.9
TOTAL	31454	15925	36475	16980	5509	58964					
TOTAL PERCENTS.	53.2	27	61.8	28.6	9.6	100					

NOTE:- THESE TWO SCHOOLS WERE TAKEN FROM WHEELWRIGHT'S BOOK ON SCHOOLS.

TABLE 13

AREAS IN SQ. FT.
OF

APARTMENT HOUSES.

NAMES	PARLORS	BEDROOMS	DINING RMS	KITCHENS	STAIR HALL	CORRIDORS	BATH ROOMS	LIBRARIES	CHAMBERS	DANTRIES	SITTING RMS	COURT	CLOSETS	GEVANTS	VEGETABLES	TOTAL	USEFUL	GENERAL	WALL	COMM.
APARTMENT BLD. PERCENTS	636	234	220	170	722	100	657	352	114		132	150			152	4304	2313	882	1159	898
	141	52	4.9	3.9	16.03	2.2	15.4	7.8	2.5		2.9	3.3			33	100	547	196	257	199
NOTE: W.W. CLAY ARCH.	TWO FLATS ON EACH FLOOR AND THREE FLOORS. EACH FLAT HAS 1 LIB.-4 BEDROOMS-DINING ROOM-BATH ETC.																			
WILCOX ESTATE PERCENTS	649	982	588	280	333	274	123					44	99			4181	876	2499	809	607
	155	234	14	6.7	7.9	6.5	2.9					15	2.3			100	218	595	187	152
NOTE: W.W. CLAY ARCH.	PLAN WITH CENTRAL COURT. 8 APARTMENTS ON FLOOR. THE KITCHEN IS BUFFET STYLE 3-4 ROOM + 16 ROOM APARTMENTS																			
CRISTOVAL PERCENTS	1306	1149	1138	783		1655	264			149	216	1375	375	646		9530	5387	2247	1775	1655
	136	121	11.9	8.4		17.3	2.8			156	225	14.4	392	6.75		100	56.3	24	19.7	17.3
NOTE: HOLLABIRD + ROCHE	4 STORIES HIGH. FIRST-STORE ROOM ALL OTHERS HAVE 6 FLATS OFFICES REPLACE FLATS ON SECOND FLOOR.																			
MODEL APPT HOUSE. No. 1. PERCENTS	1241			1179												3507				
	GENERAL AREA	15.20%																		
MODEL APPT HOUSE. PERCENTS.	961			861												2632				
	GENERAL AREA	15.13%																		

NOTE:- LAST TWO BUILDINGS TAKEN FROM ENGINEERING RECORD.
† AREAS OF LAST TWO IN PERCENTS OF LOT AREA.

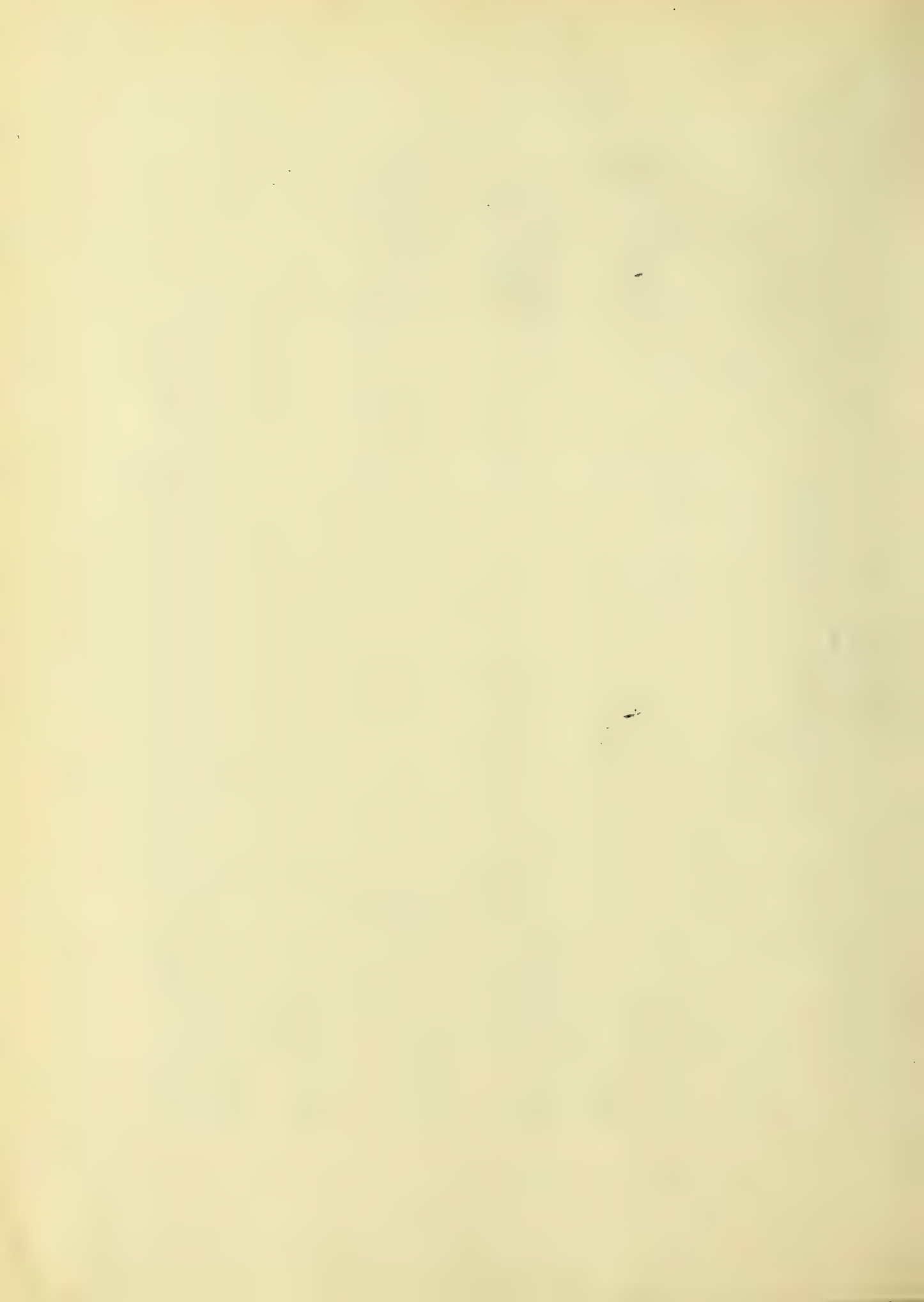


TABLE 14

AREAS IN SQ. FT.
OF

LIBRARIES

LOCATION	STORY	READING RM	STACK	DELIVERY	COMMUN.	USEFUL	GENERAL	WALL	TOTAL	USEFUL %	GENERAL %	WALL %	TOTAL %	READING RM %	STACK %	DELIVERY %	COMMUN. %
GOSHER, IND.	B				216	2044	672	659	3575	61.0	19.5	19	100				83
	M	1248	708	421	180	2121	635	589	3365	63.3	19.4	17.3	100	37	206	12.5	5.2
	TOTAL	1248	708	421	456	4165	1327	1248	6740	62.3	19.4	18.3	100	37	206	12.5	6.7
STREATOR, ILL.	M	2000	932	576	396	3202	972	920	5094	63.2	18.8	18	100	393	184	11.1	7.7
	2		932		972	3202	972	920	5094	63.2	18.8	18	100		184		18.8
	TOTAL	2000	1864	576	1368	6404	1944	1840	10188	63.2	18.8	18	100	393	184	11.1	13.5
MUSCATINE, IOWA.	M	1768	1547	408	280	3315	688	597	4600	72	15	13	100	384	336	8.9	6.1
	2				280	2271	280	296	2847	74.6	9.9	10.5	100				9.9
	TOTAL	1768	1547	408	560	5586	968	893	7447	75.8	12.4	11.8	100	384	336	8.9	8
FREEDPORT, ILL.	M	1846	1591	375	178	3437	623	812	4871	70	13.4	16.8	100	378	226	7.7	3.6
	2		1591		387	3623	454	794	4871	74.5	9.3	16.2	100		32.6		7.6
	TOTAL	1846	3182	375	565	7060	1076	1606	9742	72.3	11.3	16.4	100	378	32.6	7.7	5.6
ST. CLOUD MINN.	M	1538	1305	225	473	3029	473	693	4161	72	11.4	16.6	100	374	314	5.4	11.4
WASHINGTON IND.	M	1018	1016	362	362	2328	412	422	3164	73.4	13.3	13.3	100	322	32.1	11.4	11.4

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TABLE 15
AREAS IN SQ. FT.
OF THE
U. OF I. LIBRARY.

STORY	READING RM	STACK	LIBRARIAN	DELIVERY	ROTUNDA	HALL	PERIODICAL	CONVERSATION	OFFICES	MUSEUMS	TOILETS	CATALOGING	MACHINERY	CANITOR	SEMINARY	TRUSTEES	TOTAL	USEFUL	GENERAL	WALL	TOTAL	COMMUN.
5		1665				1012			491	3967	236	359	1208	132			12579	6482	2588	3509	12579	1012
%		132				81			39	315	188	285	1962	15			100	515	206	279	100	81
1ST	4174	1665	156	203	1401	1199	569	412			328						11825	6564	3543	1718	11825	2600
%	35	14	132	17	118	102	48	34			27						100	532	304	144	100	22
2ND		1665			830	2343			2143		648				1626	742	11825	5111	4888	1826	11825	2345
%		14			7	205			181		54				136	62	100	431	415	154	100	197
TOTAL	4174	4985	156	283	2231	4556	569	412	2634	5967	1212	359	1208	132	1626	742	36229	18157	11019	7033	36229	5957
%	115	138	43	56	675	126	156	113	725	109	334	99	330	36	449	205	100	50	305	195	100	164

TABLE 16
AREAS IN SQ. FT.
OF
HOSPITALS.

NAMES	STORY	PUBLIC WARD	PRIVATE WD	ISOLATION WD	COMMUNICATION	USEFUL	GENERAL	WALL	TOTAL	% USEFUL	% GENERAL	% WALL	% TOTAL	% PUB. WARD	% PRI. WARD	% ISO. WARD	% COMM.
BURNHAM	1	1353		226	707	2678	1201	1305	5184	57.7	23	253	100	26		44	13.6
	2		568		596	1511	685	589	2185	54.3	24.2	21.5	100		20.5		21.5
		1355	568	226	1303	4189	1886	1894	7969								
TOTAL PERCENTS		174	7.1	28.3	16.3	52.5	23.7	23.8	100								
MODEL HOSPITAL	1	1351	1080		1541	4364	2061	1717	8142	53.6	25.3	21.1	100	16.6	13.3		18.9
	2	2165	1080		1400	4293	1640	2084	8016	53.5	20.4	26.1	100	27.2	13.4		17.4
		3516	2160		2941	8657	3701	3801	16158								
TOTAL PERCENTS		21.7	13.4		18.2	53.5	22.9	23.6	100								

TABLE 17
AREAS IN SQ. FT.
OF
RESIDENCES

NAMES	STORY	COMMUN.	USEFUL	GENERAL	WALL	TOTAL	% USEFUL	% GENERAL	% WALL	TOTAL %	% COMM.
MRS. E. A. WARE CHICAGO TOTAL PERCENTS	1	473	1708	508	638	2874	59.5	17.6	22.9	100	16.4
	2	478	1854	630	329	2913	66.5	21.5	12.0	100	16.4
		951	3562	1138	967	5787					
MR. S. F. WILSON EVANSTON ILL. TOTAL PERCENTS	1	386	1227	449	424	2100	57.5	21.3	20.2	100	18.4
	2	357	1454	357	294	2100	69.0	17	14	100	22.2
		743	2681	806	718	4200					
MR. L. H. FREER HINSDALE ILL. TOTAL PERCENTS	1	632	2123	984	593	3700	57.4	26.5	16.1	100	17
	2	822	1951	1044	709	3700	52.5	28.4	19.1	100	22.2
		1454	4074	2028	1302	7400					
A. S. DRAPER LLD. CHAMPAIGN ILL. TOTAL PERCENTS	1	598	1601	875	384	2760	54.3	31.7	14	100	21.6
	2	543	1402	916	442	2760	50.7	33.1	16.2	100	19.6
		1141	2903	1791	826	5520					
TOTAL PERCENTS		207	522	324	154	100					

NOTE:- FIRST 3 ARE BRICK LAST ONE IS FRAME

TABLE 18

AREAS IN SQ. FT.

OF THE

MOLINE PLOW CO., WAREHOUSE

1ST FLOOR	1ST FLOOR		2ND. FLOOR	
	AREAS	%	AREAS	%
STAIRS	90	4	STAIRS	370 1.7
ELEVATORS	480	2.2	ELEVATORS	480 2.2
WALL	867	3.9	WALL	867 3.9
TOTAL	21900	100	TOTAL	21900 100

NOTE:- 2ND FLOOR IS REPEATED TO TOP OF BUILDING.

D.R. LLEWELLYN ARCH.

	1ST FLOOR		2ND. FLOOR	
	AREAS	%	AREAS	%
USEFUL	20463	93.6	20183	92.3
GENERAL	570	2.6	850	3.8
WALL	867	3.9	867	3.9
TOTAL	21900	100	21900	100

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TABLE 19
AREAS IN SQ. FT.
OF A
Y.M.C.A. BUILDING.

STORY	COMMUN.	USEFUL	GENERAL	WALL	TOTAL	% USEFUL	% GENERAL	% WALL	TOTAL %	% COMMUN.
13	219	4246	1827	1524	7597	53.6	24.2	20.2	100	2.9
1	660	5168	790	734	6692	75.3	12.8	11.9	100	10.5
2	790	3014	924	636	4440	65.8	20.4	13.8	100	17.6
Total	1669	12428	3541	2894	18729					
T. %	8.92	66.2	18.9	14.9	100					

NOTE: - 1ST. FLOOR CONTAINS TWO STORE ROOMS
D.R. LLEWELLYN ARCH.

TABLE 20

AREAS IN SQ. FT.
OF THE

ILLINOIS TRUST AND SAVINGS BANK.

1ST FLOOR	AREAS	%
COUNTING ROOM	11460	39
PUBLIC AREA	14744	50
VAULT AREA	1120	38
TOILETS	440	1.4
WALL	1750	58
TOTAL	29514	100

1ST FLOOR	AREAS	%
USEFUL	12380	42.6
GENERAL	15184	51.6
WALL	1750	5.8
TOTAL	29514	100
COMMUNICATION	14744	50

2ND FLOOR	AREAS	%
OFFICES	14011	52.3
BALCONY	3388	12.7
LIGHT COURT	3456	20.5
VAULT AREA	936	3.56
STAIRS	110	.41
TOILETS	757	2.83
WALL	2035	7.7
TOTAL	26693	100

2ND FLOOR	AREAS	%
USEFUL	14947	56
GENERAL	9711	36.3
WALL	2035	7.7
TOTAL	26693	100
COMMUNICATION	3498	13.6

NOTE: D.H. BURNHAM & CO., A.

TABLE 21

AREAS IN SQ.FT.
OF
CHURCHES

NAMES	SEATING CAPACITY	AUD- IANCE	COMM- UNICATION	USEFUL AREA	GENERAL AREA	WALL AREA	TOTAL AREA	% USEFUL	% GENERAL WALL	TOTAL %	% COMM. AUD.	
GRACE METHODIST BLOOMINGTON ILL.	1	348	3396	337	553	7108		86.7	88	100	4.5	47.8
CHRISTIAN CHURCH BLOOMINGTON ILL.	1	403	3526	473	1278	8417		79	56	100	56	41.9
FIRST AVE. PRESBYTERIAN DENVER COL.	1	376	3769	247	560	8465		75	69	100	3.23	44.5
M.E. CHURCH. DANVILLE ILL.	1	574	4348	752	732	823	8625	82	8.5	100	8.5	50.4
1ST M.E. CHURCH CHAMPAIGN ILL	1	388	2910	276	445	593	5684	82	7.5	100	4.8	51.2
	2			186	186	190	2070	82	8.9	100	8.9	
TOTAL			2910	462	631	783	7754	82	8.2	100	6.9	37.6
CONGREGATIONAL CHAMPAIGN ILL.	B			524	644	486	4270	73.2	14.1	100	12.3	
	1	322	2620	764	764	466	4270	71.1	18	100	18	61.3
TOTAL.		322	2620	1288	6180	952	8540	72.2	16	100	15.2	30.6

NOTE :- CHURCHES 1 + 3 HAVE GALLERIES SEATING 200 + 215 RESPECTIVELY

TABLE 22

AREAS IN SQ. FT.

OF

UNIVERSITY OF ILLINOIS BUILDINGS

NAMES	STORIES	COMMUN.	USEFUL	GENERAL	WALL	TOTAL	% USEFUL	% GENERAL	% WALL	TOTAL %	% COMMUN.
ENGINEERING HALL U of I.	3	4209	9786	4937	3965	18702	52.1	26.7	21.2	100	22.7
	1	3647	10341	4659	3478	18568	56.8	25.4	18.8	100	19.7
	2	3747	12084	3655	2830	18568	65	19.7	15.3	100	16.9
	3	2984	12079	3432	3017	18568	65	18.7	16.3	100	16.1
	TOTAL	13987	44490	16697	13290	66406	54.9	25.1	20	100	21
NATURAL HISTORY U of I.	3	4772	5566	4772	1588	11826	47	40	13	100	40
	1	3045	6382	3783	1661	11826	54	32	14	100	25.3
	2	2073	6672	2635	2143	11450	58.3	23.1	18.6	100	18.1
	3	2795	6964	2795	1812	11571	60	24.3	15.7	100	24.3
TOTAL		12697	25884	13985	7204	46673	54.8	30	15.2	100	27.2

TABLE 23

RELATIVE AREAS OF
AUDIENCE ROOM AND TOTAL AREA
PER SITTING IN CHURCHES

CHURCH	SEATING CAPACITY	AUD- IENCE.	TOTAL AREA.	SQ. FT. PER BITTING OF AUD.	SQ. FT. PER SITTING OF TOTAL
GRACE CHURCH BLOOMINGTON ILL.	348	3396	7108	9.47	20.4
CHRISTIAN CHURCH BLOOMINGTON ILL.	403	3526	8417	8.72	20.8
1ST AVE. PRESBYTERIAN DENVER COLO.	376	3769	8466	10.	22.5
M.E. CHURCH DANVILLE ILL.	574	4348	8625	7.52	15.
1ST M.E. CHURCH CHAMPAIGN ILL.	388	2910	5684	7.5	14.6
CONGREGATIONAL CHAMPAIGN ILL.	322	2620	4270	8.25	13.3

TABLE 24
ELEVATOR SERVICE

BUILDING	No OF ELEV.	RENTABLE AREA	AVERAGE AREA FLOOR	AREA PER ELEV. TOTAL	AVER. AREA PER ELEV.
ATWOOD	10	33,335	3333	11,111.2	1111
TACOMA	12	55,752	4646	11150.4	929.
MARQUETTE	16	216,384	13524	19671	1229.
OLD COLONY	17	127,073	7475	21179	1246
KATADIN	17	69139	4067	17285	1061.7
CHAMPLAIN	15	67755	4517	16938.7	1129.2
VENETIAN	13	52587	4045	13146.7	1011.2
WASCHUSETT	17	76313	4489	19078.2	1122.2
AVERAGE				16195	1099.3

TABLE 25
SQ. FT. PER BED
IN
HOSPITALS

HOSPITALS	BEDS		BEDS		TOTAL AREA IN PUBLIC W'D.	TOTAL AREA IN PRIVATE W'd.	TOTAL AREA IN ISOLATION	TOTAL AREA OF BUILDING	SQ. FT. PUB. W'D.		SQ. FT. PRI. W'D.		SQ. FT. ISO. W'D.		SQ. FT. TOTAL	
	IN PUB. WARD	IN PRI. WARD	IN PUB. WARD	IN PRI. WARD					AREA PER BED	AREA PER BED	AREA PER BED	AREA PER BED	AREA PER BED	AREA PER BED	AREA PER BED	AREA PER BED
BURNHAM	12	6	2	2	1355	568	226	7969	113	946	113	113	113	113	664	664
MODEL HOSPL	40	12			3516	2160		16158	87.9	180					404	404

TABLE 26
GRAPHICAL REPRESENTATION
OF
PERCENTS

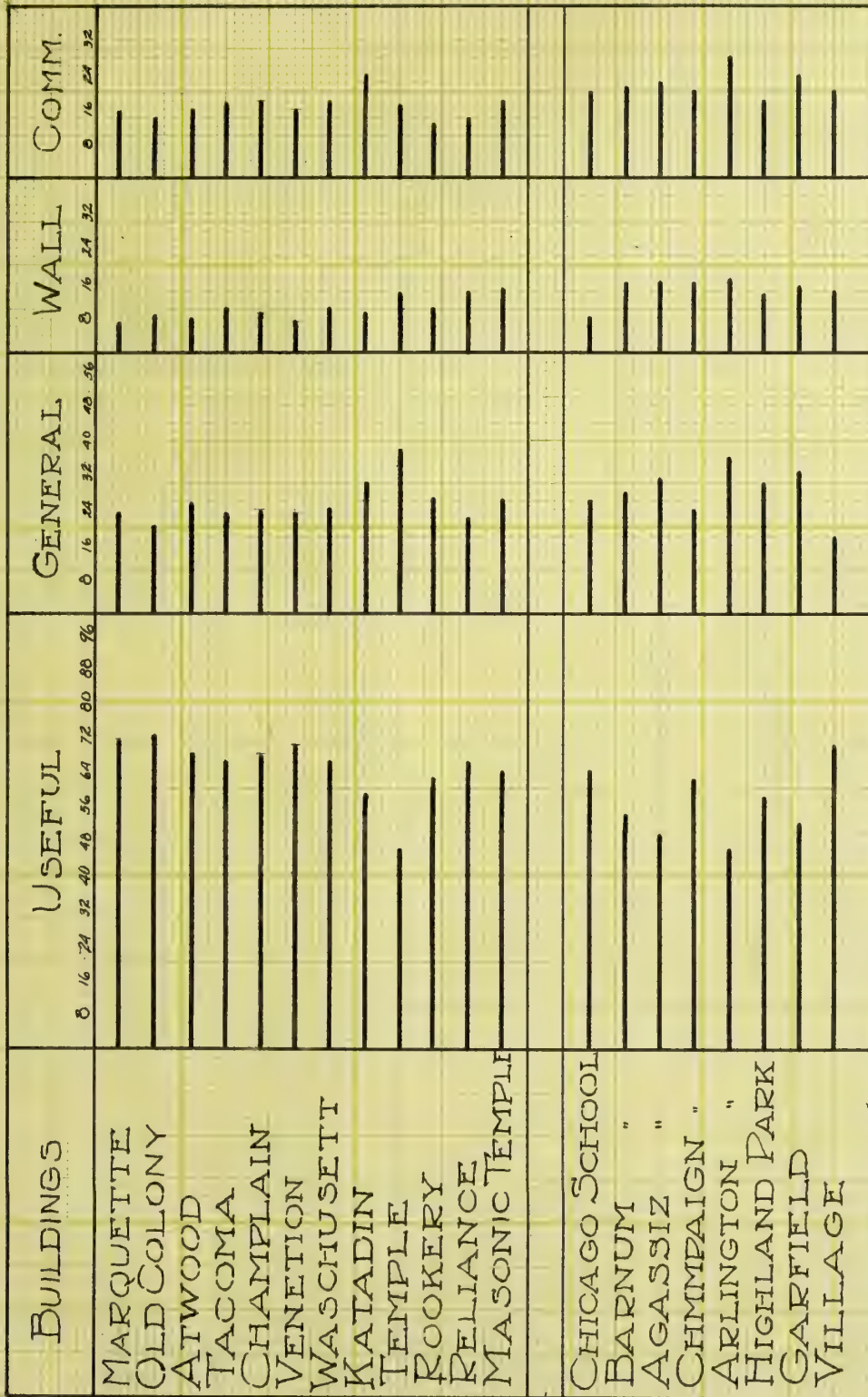


TABLE 27
GRAPHICAL REPRESENTATION
OF
PERCENTS

BUILDINGS	USEFUL 8 16 24 32 40 48 56 64 72 80 88 96	GENERAL 8 16 24 32 40 48 56	WALL 8 16 24 32	COMM. 8 16 24 32
GERMAN "				
APPART BLD'G. WILCOX ESTATE CRISTOVAL	APPARTMENT	HOUSES		
GOSHER STEATOR MUSCATINE FREEPORT ST CLOUD WASHINGTON U of I. LIBRARY	LIBRARIES			
BURNHAM MODEL	HOSPITALS			
MRS. E. A. WARE MR. S. F. WILSON. " L. H. FREER " A. S. DRAPER	RESIDENCES			

TABLE 28
GRAPHICAL REPRESENTATION
OF
PERCENTS

BUILDINGS	USEFUL	GENERAL	WALL	COMM.
MOLINE PLOW CO.	WAREHOUSE	BUILDING.		
Y.M.C.A. BLDG.				
	BANK			
ILL. TRUST & SAVINGS				
	CHURCHES			
GRACE M. CHRISTIAN PRESBYTERIAN M.E. CHURCH 1ST M.E. CONGREGATIONAL				
	U. of I. BUILDINGS			
ENGINEERING NATURAL HIST.				

Conclusions

The principal conclusions reached regarding the usual proportioning of the parts of the different classes of plans are shown in tables No. 26, 27, 28, which the writers think show an average of the relative proportions used in the best modern practice.

The most noticeable feature in the comparison is the evident similarity of the four principal quantities in most classes of buildings. To be sure the quantities vary for individual structures, as shown by the tables, the average however are alike to a marked degree.

Exceptions to this rule must be made in warehouses, storage buildings and exhibition halls. which contain little communication area and no dividing walls. These consequently give from ninety to ninety three percent useful area.

The results show that office buildings and school buildings are more nearly similar regardless of size or situation, showing that these have a more settled type, or rather showing a more thorough development in the idea of best requirements than in the other classes.

Residences perhaps repre-

-sent more nearly the other
extreme, the tastes of the
owner having more to do
with the planning than in
any other class of buildings.





